THEORY OF COMPUTATION
SET – 4

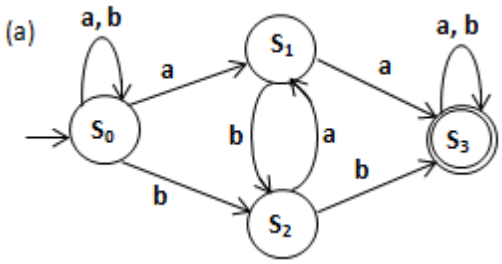
1. Consider an ambiguous grammar G and its disambiguated version D. Let the language recognized by them are L(G) and L(D) respectively. Which one is true?

(a) L(D) < L(G)
(b) L(G) < L(D)
(c) L(D) = L(G)
(d) L(D) is empty

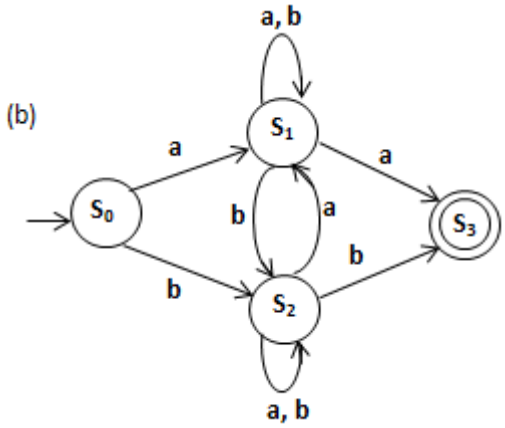
2. Consider R = (a + b)* (aa + bb) (a + b)*

Which of the following NFA recognizes the language defined by R?

(a)



(b)



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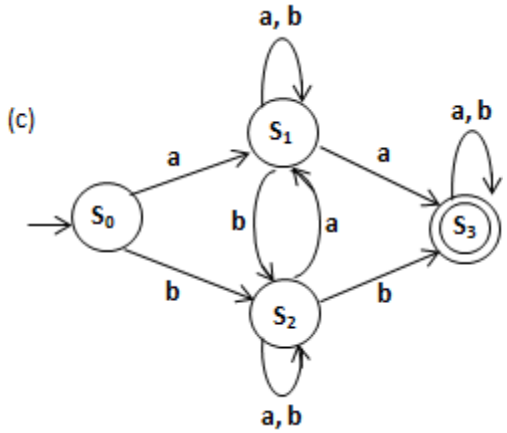
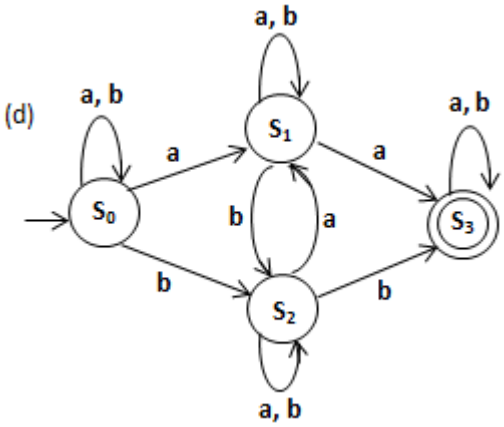
(c)

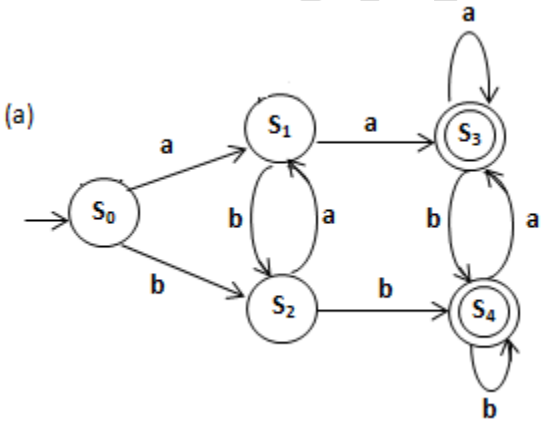


(d)



3. Which of the following DFA accepts same language accepted by R?

(a)



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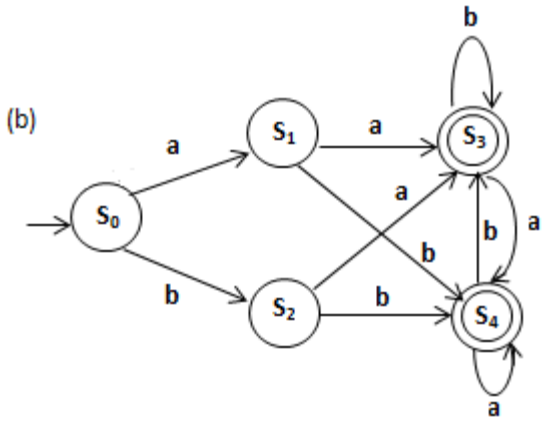
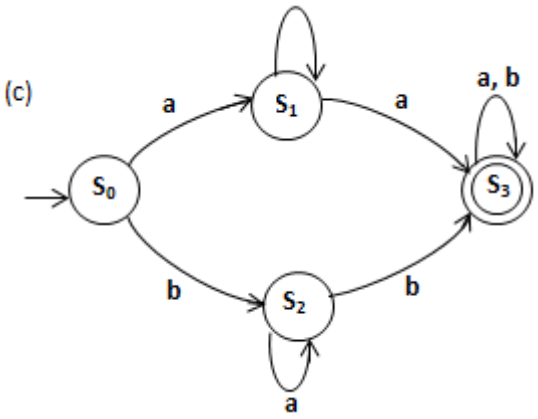
(b)



(c)



(d) None of above

4. Which one of the Regular Expression given defines the same language as defined by R?

(a) (a (ba)* + b (ab)*) (a + b)*
(b) (a (ba)* + b (ab)*)* (a + b)*
(c) (a (ba)* (a + bb) + b (ab)* (b + aa)) (a + b)*
(d) (a (ba)* (a + bb) + b (ab)* (b + aa)) $(a + b)^+$

5. For $n \geq 0$, $L_n = \{a^i b^k \mid i \geq n, 0 < k < i\}$

(a) L_n is regular, independent of value of n
(b) L_n is not regular, independent of value of n
(c) L_n is regular only for small value of n
(d) None of above

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6. Let L_1 be an infinite regular language. Let L_2 be an infinite set such that $L_2 \subset L_1$.

(a) L_2 is definitely regular because L_1 is Regular
(b) L_2 is never regular because L_2 is infinite
(c) L_2 may or may not be regular
(d) None of above

7. Consider $L_1, L_2 \subseteq \Sigma^*$ such that L_1 and $L_1 \cup L_2$ are regular.

(a) L_2 is definitely regular
(b) L_2 may not be regular
(c) L_2 is context free
(d) None of above

8. w_R denotes the reverse of w. For $L \subseteq \Sigma^*$, $L_R = \{w_R \mid w \in L\}$. Suppose L_R is not regular. Then,

(a) L is definitely regular
(b) L may or may not be regular
(c) L is definitely not regular
(d) None of above

9. Consider these 2 statements:

S_1: $a^*.\phi = a^*$
S_2: $\phi^* = \phi$

(a) Both are False
(b) Both are True
(c) $S_1 \rightarrow$ T, $S_2 \rightarrow$ F
(d) $S_1 \rightarrow$ F, $S_2 \rightarrow$ T

10.

Statement I: L_i be regular language i = 1, 2, . . ., ∞
Language $\bigcap_{i=1}^{\infty} L_i$ is regular i.e. Infinite intersection.

Statement II: $L = \{wx \mid w \in \Sigma^*, x \in \Sigma^*, |w| = |x|\}$ is regular.

(a) Both are True
(b) Both are False
(c) $S_1 \rightarrow$ True, $S_2 \rightarrow$ False
(d) $S_1 \rightarrow$ False, $S_2 \rightarrow$ True

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